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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,789	06/26/2003	Eric J. Bergman	54008.8026.US00	6887

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EXAMINER

CARRILLO, BIBI SHARIDAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/608,789	Applicant(s) BERGMAN, ERIC J.	
	Examiner Sharidan Carrillo	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>05/21/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-12 and 21, drawn to a method of cleaning and drying a workpiece by removing a workpiece at a controlled, classified in class 134, subclass 1.
 - II. Claims 13-20, drawn to a method of cleaning and drying a workpiece by removing a liquid at a controlled rate, classified in class 134, subclass 26.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Mr. Ken Ohriner on 8/18/04 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-12 and 21. Affirmation of this election must be made by applicant in replying to this Office

action. Claims 13-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite because it is unclear whether the organic vapor dries the workpiece. The preamble recites a method of cleaning and drying the workpiece. However, there is no correlation between the method steps and the drying step, as recited in the preamble. Claim 2 is indefinite because "the step of irradiating" lacks positive antecedent basis. It is unclear whether the step of irradiating refers to the application of sonic energy.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 4-12, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Ferrell et al. (5974689).

Ferrell et al. teach a method and apparatus for cleaning and drying a workpiece. In reference to claims 1 and 21, Ferrell et al. teach immersing the workpiece in an aqueous solution in a process vessel 11, providing sonic agitation into the aqueous solution via transducers 19a, 19b, delivering an organic vapor (HFE or IPA, col. 3, lines 25-30, col. 3, lines 45-50, col. 7, lines 55-60) to a region above the surface of the aqueous solution to create a reduced surface tension (Figs. 3C, 3D, col. 5, lines 40-45), raising the workpiece out of the aqueous solution at a controlled rate (col. 7, lines 25-27, col. 3, lines 50-55) and continuing the sonic agitation while the liquid-vapor interface passes across the workpiece surface (col. 3, lines 50-55, col. 3, lines 60-65). Additionally, Ferrell et al. teach withdrawing the workpiece from the aqueous solution as the bottom zone of the workpiece is still immersed in the solution, wherein the solution is subjected to sonic agitation (col. 6, lines 55-60).

In reference to claims 4 and 8, refer to col. 4, lines 15-17. In reference to claims 5 and 12, refer to Figs. 3C, 3D, and 15. In reference to claim 6, refer to Fig. 1 and col. 7, lines 15-17. In reference to claim 7, Ferrell et al. teach 0.5cm/sec which is equivalent to 5 mm/sec. In reference to claim 9, Ferrell et al. teach using DI water or some suitable liquid (col. 2, lines 60-63. In col. 1, lines 15-20, Ferrell et al. teach chemical baths containing strong acids such as HCl, strong bases NH_4OH , and oxidizers. In reference to claim 10, refer to col. 7, lines 55-62. In reference to claim 11, refer to Fig. 1.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrell et al. (6974689) in view of Danes (6457478).

Ferrell et al. teach the invention substantially as claimed with the step of irradiating the workpiece and delivering the organic vapor with a carrier gas. Danese teaches a method for treating a workpiece with UV light. In col. 2-3 bridging, Danese teaches it is conventional in the art to dry the wafer with nitrogen pressurized IPA, as it flows to a sonic head attached to the top of the drying chamber. Additionally, col. 2, lines 20-30, teaches it is well known in the art to use UV light to remove surface contaminants from the wafer surface.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Ferrell et al. to include nitrogen pressurized IPA and UV light, since Danese teaches these steps are conventionally and notoriously used for the treatment of semiconductor wafers. It would have been obvious to a skilled artisan to use nitrogen, as taught by Danese, as a carrier gas for IPA during the drying of the wafer surface. Additionally, it would have been with the level of the skilled artisan to have modified the method of Ferrell et al., to include UV, as taught by Danese, for purposes of enhancing removal of contaminants from the wafer surface.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Scranton et al., Coberly et al., Tsukazaki, and Andreas et al. teach rinsing and drying a wafer using IPA. Kishida et al. and Yang teach removing the wafer at a controlled rate from the solution. Danese teaches treating the wafer with UV light. Ogura teaches cleaning with ultrasonic vibrations. Otsuka teaches ultrasonic cleaning apparatus. Steck teaches cleaning, rinsing, and drying silicon wafers. Bergman et al. teach wafer processing and drying. Lin teaches a dryer lid for the substrate dryer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on Monday-Friday, 6:00a.m-2:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sharidan Carrillo
Primary Examiner
Art Unit 1746

bsc



SHARIDAN CARRILLO
PRIMARY EXAMINER